CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 87-081

WASTE DISCHARGE REQUIREMENTS FOR:

BIOSYSTEMS MANAGEMENT INTERNATIONAL,
S. H. COWELL FOUNDATION AND WELLS FARGO BANK
SLUDGE APPLICATION TO LAND
HALF MOON BAY, SAN MATEO COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter the Board), finds that:

1. Biosystems Management International (BMI), S. H. Cowell Foundation and Wells Fargo Bank, hereinafter referred to collectively as the discharger, by application dated February 26, 1987, have applied for waste discharge requirements and a permit to apply sewage sludge on agricultural land.

2. The discharger proposes to apply digested municipal sludge as fertilizer at the Purisima Ranch (see Attachment A which is incorporated herein and made a part of this Order). The 130 acre Ranch is located approximately 4 miles south of the City of Half Moon Bay. The Ranch is bisected by Highway 1, bordered by Verde Road on the east and slopes toward the Pacific Ocean. The Ranch farmed by Mr. Robert Marsh currently grows pine (Christmas) trees, grain, barley and oat hay.

3. The discharger proposes to spread the digested sludge at a rate of up to 60 dry tons/acre/year. Current plans show sludge from the City of Burlingame will be used; however, sludge of good quality originating from other municipalities in San Mateo County may be approved on a case-by-case basis. Sludge from the City of Burlingame was analyzed and found to be nonhazardous as defined in Title 22, California Administrative Code, Sections 66699 and 66700.

4. The discharger report that the site is gently rolling agricultural land above the 100-year flood plain. The native Watsonville-Elkhorn soil consists of well-drained to imperfectly drained soil that was developed into silty clay loam on alluvium that came from various rock sources. Below approximate one foot of surface soil is a claypan subsoil with a permeability of less than 0.06 inch per hour and thickness of about two and half feet. The claypan subsoil is underlain by marine sediments. The surface soil is medium to strongly acid with pH of 6.5 to 5.0 and the substratum soil is neutral with pH of 6.5 or above.

5. The discharger reports two surface reservoirs are located in the sludge application area to capture drainage during winter periods. When the reservoirs are full, the drainage may overflow into the adjacent channels and finally into the Pacific Ocean.

6. Groundwater is derived from precipitation and surface runoff which percolates into the marine terrace deposits and alluvial valley sediments.

Nine groundwater basins have been identified within the coastal area of San Mateo County. They are located in the extreme western part of the coastal area and parts of these basins are probably in hydraulic continuity with the Pacific Ocean. Wells in the Half Moon Bay Terrace generally produce water from depths of up to 80 feet. Movement of groundwater is generally toward the stream valleys and, in the coastal terraces, toward the west. The yields of the wells in this area are too low to allow substantial economical development; however, individual wells could provide small domestic or agricultural supplies.

7. The State Water Resources Control Board, in November 1983, adopted the revised "Water Qualtiy Control Plan for the Ocean Waters of California" which contains water quality objectives for the Pacific Ocean.

8. The beneficial uses of the Pacific Ocean are:

   - o Water contact and Non-contact water recreation
   - o Wildlife habitat
   - o Preservation of rare and endangered species
   - o Marine habitat
   - o Fish migration and spawning
   - o Industrial service supply
   - o Shellfish harvesting
   - o Navigation
   - o Commercial and sport fishing

9. The beneficial uses of groundwater in the vicinity of the discharge are:

   - o Domestic supply
   - o Agricultural supply

10. Environmental Protection Agency criteria for classification of solid waste disposal facilities and practices are contained in Federal Register 40 CFR Part 257 and State Water Resources Control Board regulations governing waste disposal to land are contained in Subchapter 15, Chapter 3, Title 23 of the California Administrative Code (CAC). This Order implements both federal and state regulations for waste disposal to land. This site meets criteria for classification as a Land Treatment Facility suitable for receiving sewage sludge.

11. The discharger has certified that all local agencies with jurisdiction have approved use of the site for sewage sludge application.

12. The North San Mateo County Sanitation District has certified a final environmental impact report entitled "San Mateo County Coastside Wastewater Solids Project, August 1980" in accordance with the California Environmental Qualty Act (Public Resource Code Section 21000 et seq.).

13. The project as approved by the North San Mateo County Sanitation District may have water quality impact on the groundwater beneath the project site. Prohibition A.10 and Provision C.2 of the Waste Discharge Requirements mitigate or avoid the adverse environmental impacts of the project on the groundwater quality.

14. The discharger and interested agencies and persons have been notified of

the Board's intent to issue requirements for the proposed discharge and have been provided with the opportuntiy for a public hearing and the opportuntiy to submit their written views and recommendations.

15. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that the Biosystems Management International, S. H. Cowell Foundation and Wells Fargo Bank, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder and the provisions of the Clean Water Act as amended and regulations and guidelines adopted thereunder, shall comply with the following:

A. Prohibitions

1. Neither the transport, handling, storage nor application of sewage sludge shall cause a condition of pollution or nuisance as defined by Section 13050(m) of the California Water Code.

2. No waste that contains contaminants in concentrations in excess of threshold limits set forth in Title 22, CAC, Sections 66699 and 66700 shall be disposed of on the site.

3. No waste that contains polychlorinated biphenyls (PCBs) in concentrations exceeding 5 mg/kg (dry weight) shall be disposed of on the site.

4. The sludge transportation, handling, storage and application shall not cause the following conditions to exist in waters of the State at any place:

   a. Floating, suspended, or deposited macroscopic particulate matter or foam;

   b. Bottom deposits or aquatic growth;

   c. Alteration of temperature, turbidity, or apparent color beyond natural background levels;

   d. Visible, floating, suspended or deposited oil or other products of petroleum origin;

   e. Toxic or other deleterious substances to be present in concentrations or quantities which may cause deleterious effects on aquatic biota, wildlife or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentrations.

5. The disposal area shall be protected from any washout or erosion of sludge and from inundation, which could occur as a result of a 100 year 24 hour precipitation event.

6. Public access shall be prohibited for at least twelve (12) months after all sludge application on an area has been terminated.

7. Grazing animals shall not be permitted on the disposal area which has received sewage sludge within the preceeding thirty (30) days.

8. Milking animals shall not be permitted on the disposal area for at least twelve (12) months after the last sludge application on an area. Where the milk is unpasteurized, no access shall be allowed.

9. Planting of food crops that are consumed by humans without undergoing processing which eliminateds pathogens prior to distribution to the consumer shall be prohibited for at least five (5) years after the last sludge application.

10. The application of sewage sludge shall not cause a statistically significant increase in concentration of constituents in the groundwater beyond the maximum contaminant levels (MCLs) set forth in Title 22, Chapter 15, Articles 4 and 5 of the CAC. Where the MCLs are already exceeded in the existing groundwater, the application of sewage sludge shall not further degrade the existing groundwater quality.

B. Specifications

1. Sludge shall not be applied on any area outside the designated area shown on Attachment A.

2. Sludge shall not be applied on the disposal area between November 1 and April 30 of each year.

3. Sludge shall not be applied within 100 feet of the surface reservoirs, and any natural drainage channel.

4. The pH of the sludge and soil mixture shall be maintained at 6.5 or greater at the time of each sludge application.

5. The annual cadmium application rate shall not exceed 0.5 kg/ha (0.45 lb/acre).

6. The cumulative metal application rate shall not exceed the following:

Metal	Area East of Highway 1 Limitation(1), kg/ha (lb/ac)	Area West of Highway 1 Limitation(2), kg/ha/(lb/ac)
Cadmium	20 (18)	10 (9)
Copper	500 (445)	250 (223)
Lead	800 (713)	400 (356)
Nickel	200 (178)	100 (89)
Zinc	1000 (891)	500 (445)

(1) Based on soil cation exchange capacity (CEC) greater than 15 meq/100 gm.
(2) Based on soil CEC less than 15 but greater than 5 meq/100 gm.

7. When any of the above listed amounts of metals have been placed on an area, all future sludge disposal on that area is prohibited.

8. Sludge shall be incorporated into the soil within 48 hours of application.

C. Provisions

1. The discharger shall comply with all sections of this Order immediately upon adoption.

2. The discharger shall develop and install a vadose zone and/or groundwater monitoring system in accordance with Subchapter 15, Chapter 3, Title 23 of CAC, which is acceptable to the Executive Officer, within 30 days of adoption of this Order. The vadose zone and/or groundwater monitoring system shall be capable of adequately monitoring the disposal area for compliance with Prohibition A.10 of this Order.

3. The present and future property owners and site operator shall have continuing responsibility for correcting any problems which arise in the future as a result of sludge disposal or related operations.

4. The discharger shall file with the Board monthly self-monitoring reports performed according to any self-monitoring program issued by the Executive Officer.

5. In the event that sources of sludge other than that from the City of Burlingame are proposed for soil amendment on the site, prior approval shall be obtained from the Executive Officer.

6. The discharger shall permit the Board or its authorized representatives, upon presentation of credentials:

   a. Entry upon the premises on which wastes are located or in which any required records are kept.

   b. Access to copy any records required to be kept under the terms and conditions of this Order.

   c. Inspection of any treatment equipment, monitoring equipment, or monitoring method required by this Order.

   d. Sampling of any discharge or groundwater covered by this Order.

7. These requirements do not exempt the discharger from compliance with any other laws, regulations, or ordinances which may be applicable; they do not legalize this waste disposal site and they leave unaffected any further restraint on the disposal of wastes at this site which may be contained in other statutes or required by other agencies.

8. Transfer of control or ownership of property on which sludge has been disposed shall be preceded by a notice to the Regional Board at least 30 days in advance of the proposed transfer date. The notice must include a written agreement between the present and proposed owners and operators acknowledging the waste discharge requirements on the

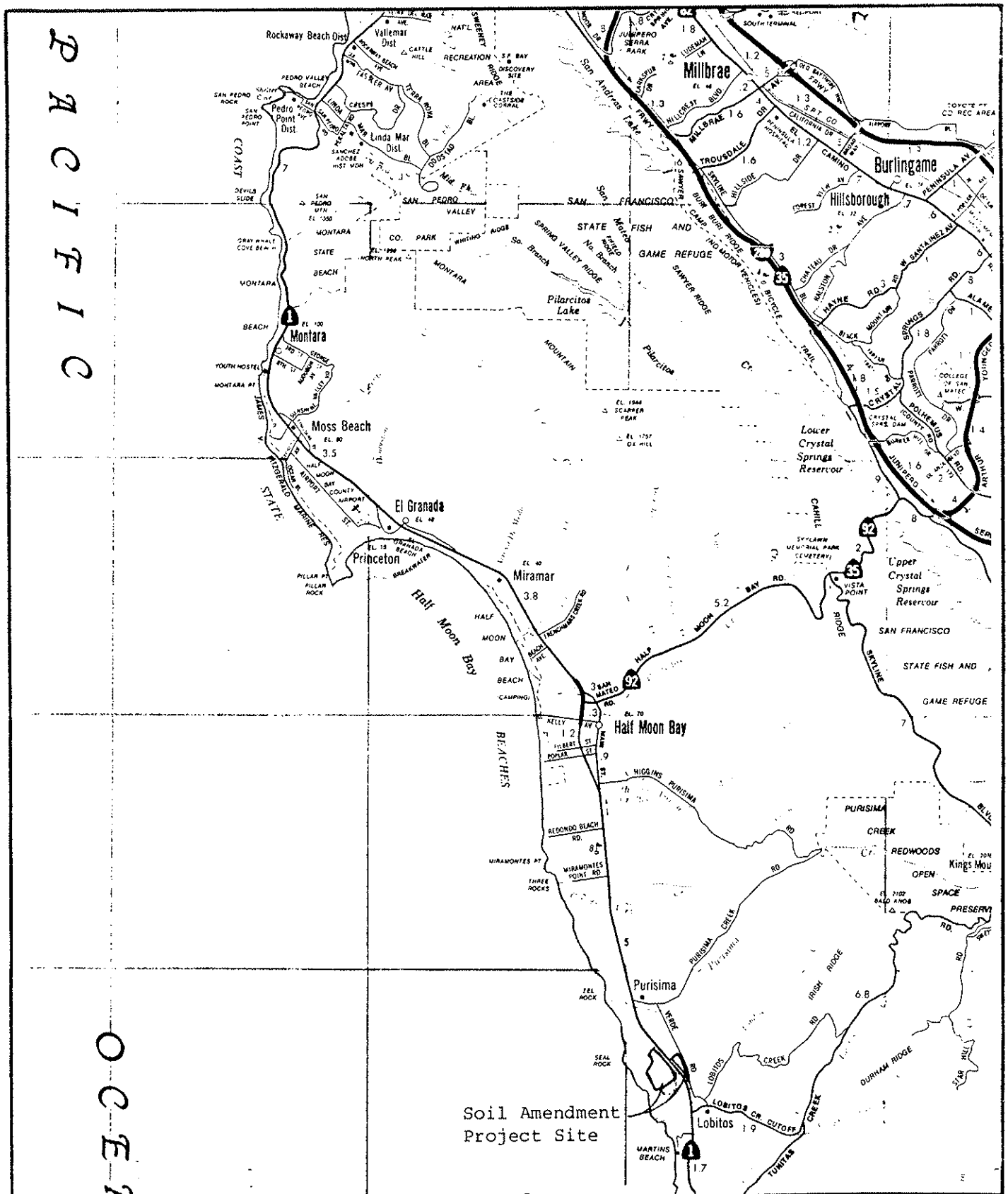
site and the continuing responsibility of all owners and operators for correcting any problems which arise in the future as a result of sludge disposal or related operation.

9. This Order is subject to Board review and updating, as necessary, to comply with changing State or Federal laws, regulations, policies, or guidelines; changes in the Regional Board Basin Plan and the State Board Ocean Plan; or changes in the discharge characteristics, in five year increments from the effective date of this Order.

I, Roger B. James, Executive Officer do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region on July 15, 1987.

ROGER B. JAMES
Executive Officer

Attachments:
A. Location Map
B. Self-Monitoring Program



STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

APPENDIX D

Project Location

DRAWN BY:	DATE:	DRWG. NO.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM
FOR

BIOSYSTEMS MANAGEMENT INTERNATIONAL

AND

S. H. COWELL FOUNDATION AND WELLS FARGO BANK

SAN MATEO COUNTY

ORDER NO. 87-081

PART A

A. GENERAL

Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13383, and 13387(b) of the Califorina Water Code and this Regional Board's Resolution No. 73-16. This Self-Monitoring Program is issued in accordance with Section C.4 of Regional Board Order No. 87-081.

The principal purposes of a self-monitoring program by a waste discharger are: (1) to document compliance with waste discharge requirements and prohibitions established by the board, (2) to facilitate self-policing by the waste discharger in the prevention and abatement of pollution arising from waste discharge, (3) to develop or assist in the development of effluent standards of performance, pretreatment and toxicity standards and other standards, and (4) to prepare water and wastewater quality inventories.

B. SAMPLING AND ANALYTICAL METHODS

Sample collection, storage, and analyses shall be performed by a laboratory approved for these analyses by the State Department of Health. The director of the laboratory whose name appears on the certification shall supervise all analytical work in his/her laboratory and shall sign all reports of such work submitted to the Regional Board.

All monitoring instruments and equipment shall be properly calibrated and maintained to ensure accuracy of measurements.

C. DEFINITION OF TERMS

1. A grab sample is a discrete sample collected at any time.

2. Receiving water(s) refers to any water which actually or potentially receives surface water which passes over or through waste materials or contaminated soils. In this case the groundwater beneath and adjacent to the sludge application site, the Pacific Ocean and contiguous waters are considered the receiving waters.

3. Standard observations refer to:

   a. Receiving Waters

      1) Discoloration and turbidity: description of color, source, and size of affected area.

      2) Evidence of odors, presence or absence, characterization, source, and distance of travel from source.

      3) Evidence of beneficial use: presence of water associated wildlife.

      4) Flow rate.

5) Weather conditions: wind direction and estimated velocity, total precipitation during the previous five days and on the day of observation.

b. Perimeter of the waste management unit

1) Evidence of liquid leaving or entering the waste management unit, estimated size of affected area and flow rate. (Show affected area on map)

2) Evidence of odors, presence or absence, characterization, source, and distance of travel from source.

3) Evidence of erosion.

c. The waste management unit

1) Evidence of ponded water at any point on the waste management unit.

2) Evidence of odors, presence or absence, characterization, source, and distance of travel from source.

3) Evidence of erosion.

D. SCHEDULE OF SAMPLING, ANALYSIS, AND OBSERVATIONS

The discharger is required to perform sampling, analysis, and observations according to the schedule specified in PART B, and the requirements of Article 5 of Subchapter 15.

E. RECORDS TO BE MAINTAINED

Written reports shall be maintained by the discharger, and shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board. Such records shall show the following for each sample:

1. Identity of sample and sample station number.

2. Date and time of sampling.

3. Date and time that analyses are started and completed, and name of the personnel performing the analyses.

4. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used except for the analyses performed by a certified laboratory.

5. Calculation of results.

6. Results of analyses, and detection limits for each analyses.

F. REPORTS TO BE FILED WITH THE REGIONAL BOARD

1. Written self-monitoring reports shall be filed each calendar quarter by the fifteenth day of the following month. In addition, an annual report shall be filed as indicated in the following item F.2. The reports shall be comprised of the following:

   a. Letter of transmittal

      A letter transmitting the essential points in each self-monitoring report should accompany each report. Such a letter shall include a discussion of any requirement violations found during the past quarter and actions taken or planned for correcting the violations, such as operation modifications and/or facilities expansion. If the discharger has previously submitted a detailed time schedule for correcting requirement violations, a reference to the correspondence transmitting such schedule will be satisfactory. If no violations have occurred in the last quarter this shall be stated in the letter of transmittal. Monitoring reports and the letter transmitting reports shall be signed by a principal executive officer at the level of vice president or his duly authorized representative if such representative is responsible for the overall operation of the facility from which the discharge originates. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true, complete, and correct.

   b. Each report shall include a compliance evaluation summary sheet. This sheet shall contain:

      The sample mean and the sample variance for all sample sets taken from all compliance points, and shall determine if the difference between the mean of each sample set and the water quality protection standard is significant at the 0.05 level using Cochran's Approximation to the Behrens-Fisher Student's t-test as described in Appendix II of Subchapter 15. The discharger may propose an alternative statistical procedure to be used in making this determination pursuant Section 2555(h)(3) of Subchapter 15. If a statistically significant difference is found this shall be reported as a suspected requirement violation in the letter of transmittal.

   c. A map or aerial photograph shall accompany each report showing observation and monitoring station locations.

   d. A summary and certification of the standard observations for the receiving waters, the waste management unit, and the perimeter of the waste management unit.

   e. Laboratory statements of results of analyses specified in PART B must be included in each report. The laboratory director shall sign the laboratory statement of analytical results.

   f. A daily log recording sludge applied. The log shall include the

following information:

(a) Volume (cubic yards) and weight (dry tons) of sludge applied.
(b) Source(s) of sludge.
(c) Percent solids representative of each load.
(d) Area (acres) of application clearly shown on a map of the spreading area.
(e) Sludge application rate
    a. Tons of wet sludge per acre
    b. Tons of dry sludge per acre
(f) Heavy metal application rate, lb/acre
(g) Cumulative application of heavy metal, lb/acre
    lb/acre from newly applied sludge + lb/acre from previously applied sludge

2. By January 31 of each year the discharger shall submit an annual report to the Regional Board covering the previous calendar year. This report shall contain:

   a. Tabular and graphical summaries of the monitoring data obtained during the previous year.

   b. A comprehensive discussion of the compliance record, and the corrective actions taken or planned which may be needed to bring the discharger into full compliance with the waste discharge requirements.

PART B

1. DESCRIPTION OF MONITORING STATIONS AND SCHEDULE OF MONITORING

A. On-site Observations

STATION	DESCRIPTION
V-1 thru V-'n'	Locatedon the sludge application area at theintersection of lines on a 500 foot grid network
P-1 thru P-'n'	Located at equidistant intervals not exceeding 500 feet around the perimeter of the application area

A map showing visual and perimeter compliance points (V and P stations) shall be submitted by the discharger in the monthly report.

B. Overflow Monitoring

STATION	DESCRIPTION
O-1 thru O-'n'	Overflow from the two surface reservoirs

C. Vadose Zone Monitoring

STATION	DESCRIPTION
VA-1 (soil pore water background)	To be installed
VA-2 thru VA-'n' (soil pore water compliance points)	To be installed

The initial self-monitoring report shall include a map showing the soil pore water compliance points.

D. Sludge Monitoring

Each year, prior to the operating season, a representative composited sludge sample for each sludge source shall be analyzed for Total Threshold Limit Concentration (TTLC) and Soluble Threshold Limit Concentration (STLC) of constituents set forth in Title 22, California Adminisrative Code, Sections 66699 and 66700. During the operating season, representative composited sludge sample for each sludge source shall also be analyzed.

E. Soil Monitoring

Two diagonal transects shall be established for each of the four fields. At least five samples shall be taken along each transect, and shall be representative of the 0" to 12" depth range. Soil samples from a given field shall be composited and analyzed.

F. Crop Monitoring

For each field to which sludge has been applied, representative samples shall be taken annually from whatever portion of the plant is removed from the field (example - leaf grain, seed or bale). If more than one crop is grown then a representative of each type shall be analyzed. Results shall be reported specifically for each field. Samples shall be taken at time of harvesting.

2. Schedule of Sampling, Observation and Analyses

The schedule of sampling, observation and analyses shall be that given in Table I.

I, Roger B. James, Executive Officer, hereby certify that the foregoing self-monitoring program:

1. Has been developed in accordance with the procedure set forth in this Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with sludge disposal specifications established in the Board's Order No. 87-081.

2. Is effective in the date shown below.

3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger, and revisions will be ordered by the Executive Officer.

Roger B. James

ROGER B. JAMES
Executive Officer

Effective Date July 21, 1987

Attachment:
Map of the Purisima Ranch

TABLE 1

SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS

Sampling Station	Sludge		Soil	Crop	All V Sta	All P Sta	All VASta	All O Sta			
TYPE OF SAMPLE	Comp		DI		O	O	G	G			
Flow Rate (mgd)											
BOD, 5-day, 20 C, or COD (mg/l & kg/day)											
Chlorine Residual & Dosage (mg/l & kg/day)											
Settleable Matter (ml/l-hr. & cu. ft./day)								E			
Total Suspended Matter (mg/l & kg/day)											
Oil and Grease (mg/l & kg/day)											
Coliform (Total or Fecal) (MPN/100 ml) per req't											
Fish Tox'y 96-hr. TL & Surv'l in undiluted waste											
Ammonia Nitrogen (mg/l & kg/day)	M*										
Nitrate Nitrogen (mg/l & kg/day)	M*						Q				
Nitrite Nitrogen (mg/l & kg/day)	M*										
Total Organic Nitrogen (mg/l & kg/day)	M*										
Total Phosphate (mg/l & kg/day)											
Turbidity (Jackson Turbidity Units)											
pH (units)	M		M				Q	E			
Dissolved Oxygen (mg/l and % Saturation)											
Temperature (°C)											
Apparent Color (color units)											
Secchi Disc (inches)											
Sulfides (if DO<5.0 mg/l) Total & Dissolved (mg/l)											
Arsenic (mg/l & kg/day)	2/Y*						Q	E			
Cadmium (mg/l & kg/day)	M*			Y			Q	E			
Chromium, Total (mg/l & kg/day)	2/Y*						Q	E			
Copper (mg/l & kg/day)	M*			Y			Q	E			
Cyanide (mg/l & kg/day)	2/Y*						Q	E			
Silver (mg/l & kg/day)	2/Y*						Q	E			
Lead (mg/l & kg/day)	M*			Y			Q	E			
Barium (mg/l)	2/Y*						Q	E			
Selenium (mg/l)	2/Y*						Q	E			
% Solids	M										
Bulk Density (lbs/cu yd)	M										
Cation Exchange Capacity (meq/100 gram)			2/Y								

TABLE I (continued)
SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS

Sampling Station	Sludge		Soil	Crop	All V Sta	All P Sta	All VA Sta	All O Sta			
TYPE OF SAMPLE	Comp		DI		O	O	G	G			
Mercury (mg/l & kg/day)	2/Y**						Q	E			
Nickel (mg/l & kg/day)	M**			Y			Q	E			
Zinc (mg/l & kg/day)	M**			Y			Q	E			
PHENOLIC COMPOUNDS (mg/l & kg/day)											
All Applicable Standard Observations					Q	Q					
Bottom Sediment Analyses and Observations											
Total Identifiable Chlorinated Hydrocarbons (mg/l & kg/day)							Q	E			
Polychlorinated Biphenyls	M**										
Total Dissolved Solids (mg/l)							Q				
Chloride (mg/l)							Q				

LEGEND FOR TABLE

TYPES OF SAMPLES

- G = grab sample
- C-24 = composite sample - 24-hour
- C-X = composite sample - X hours (used when discharge does not continue for 24-hour period)
- Cont = continuous sampling
- DI = depth-integrated sample
- BS = bottom sediment sample
- O = observation

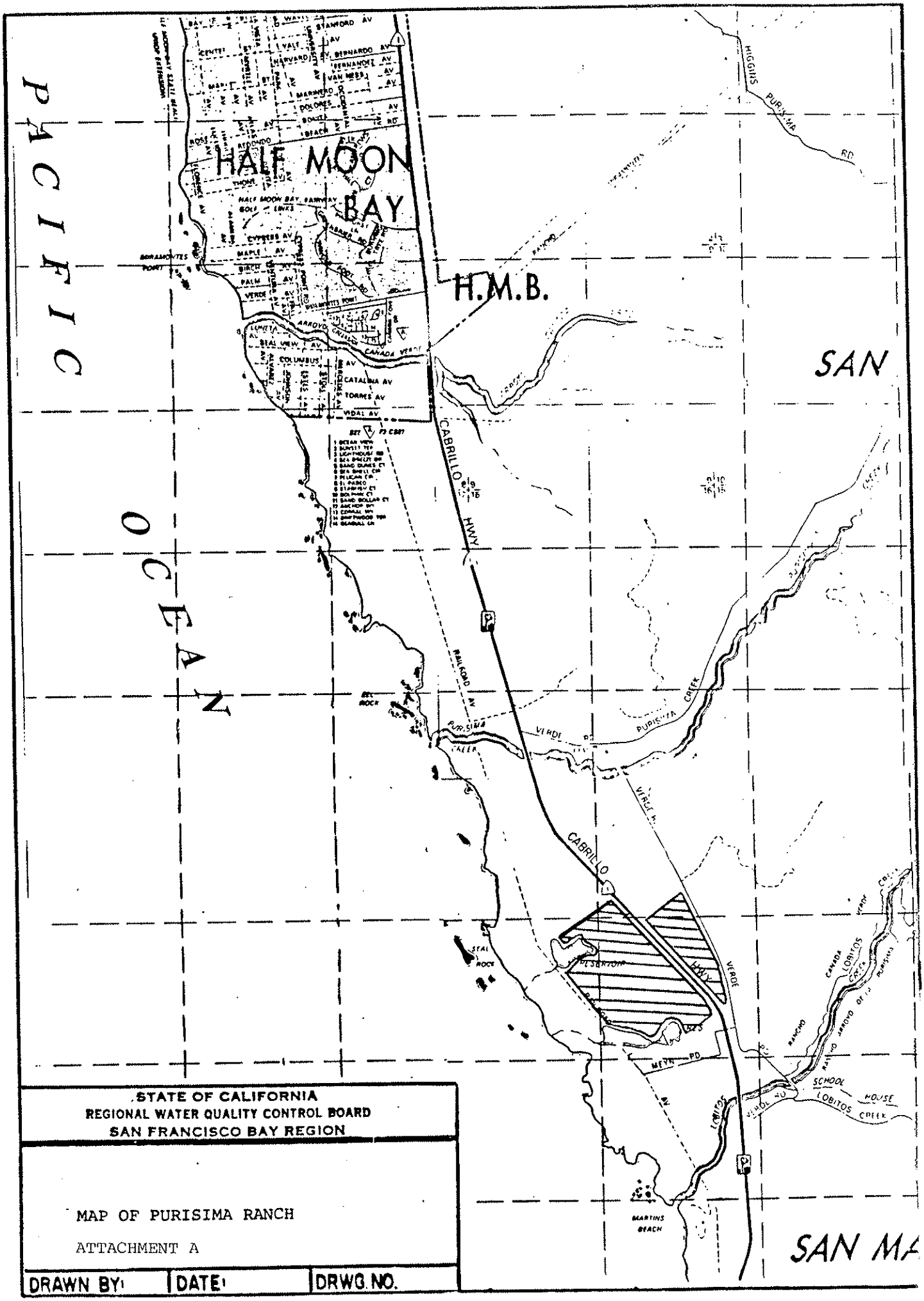
TYPES OF STATIONS

- I = intake and/or water supply stations
- A = treatment facility influent stations
- E = waste effluent stations
- C = receiving water stations
- P = treatment facilities perimeter stations
- L = basin and/or pond levee stations
- B = bottom sediment stations
- G = groundwater stations

FREQUENCY OF SAMPLING

- E = each occurence
- H = once each hour
- D = once each day
- W = once each week
- M = once each month
- Y = once each year
- 2/H = twice per hour
- 2/W = 2 days per week
- 5/W = 5 days per week
- 2/M = 2 days per month
- 2/Y = once in March and once in September
- Q = quarterly, once in March, June, Sept. and December
- 2H = every 2 hours
- 2D = every 2 days
- 2W = every 2 weeks
- 3M = every 3 months
- Cont = continuous

* expressed in % dry solids
** expressed in mg/kg dry weight



STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

MAP OF PURISIMA RANCH

ATTACHMENT A

DRAWN BY:	DATE:	DRWG. NO.